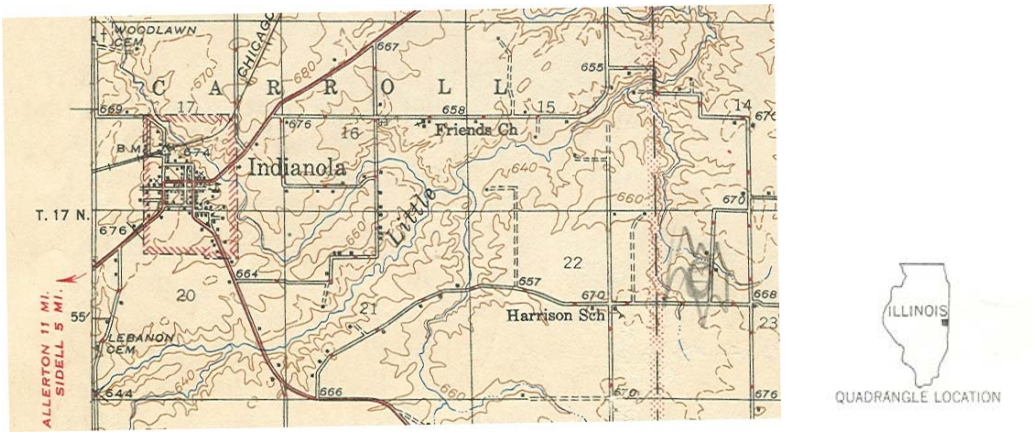
Midwest Technology Assistance Center
Groundwater Resource Assessment for Small Communities

Groundwater Availability
At
Indianola, Illinois
(Vermilion County)

Project Overview
This project is an outgrowth of the Public Service Program of the Center for Groundwater Science (CGS) at the Illinois State Water Survey. For over 50 years, the CGS has provided groundwater information to any requesting individual, commercial facility or public water facility. Groundwater resource assessments have been an integral part of this public service and have been undertaken for thousands of individuals and facilities throughout its history. Community groundwater supplies that have been identified as potentially "deficient" are the targets for this project. The criterion used for determining community deficiency were; 1) Water Supply and Demand (operating time), 2) Aquifer Limitation, 3) Well Specific Capacity, and 4) Facility History. The Village of Indianola has been identified as a target community for groundwater assessment through this project.

Project Goal
To provide a resource tool of pertinent groundwater information to each target facility. This document describes a summary of historic information, current conditions and the potential for expansion of the water supply within 5 and 10 miles of Indianola.

Indianola (Vermilion County)



The Village of Indianola (Facility Number 1830500) utilizes one active community water supply wells. Well No. 3 (Illinois EPA Nos. 47696) supplies an average of 24,000 gallons per day (gpd) to 112 services or a population of 350. Aqua Illinois maintains the water supply.

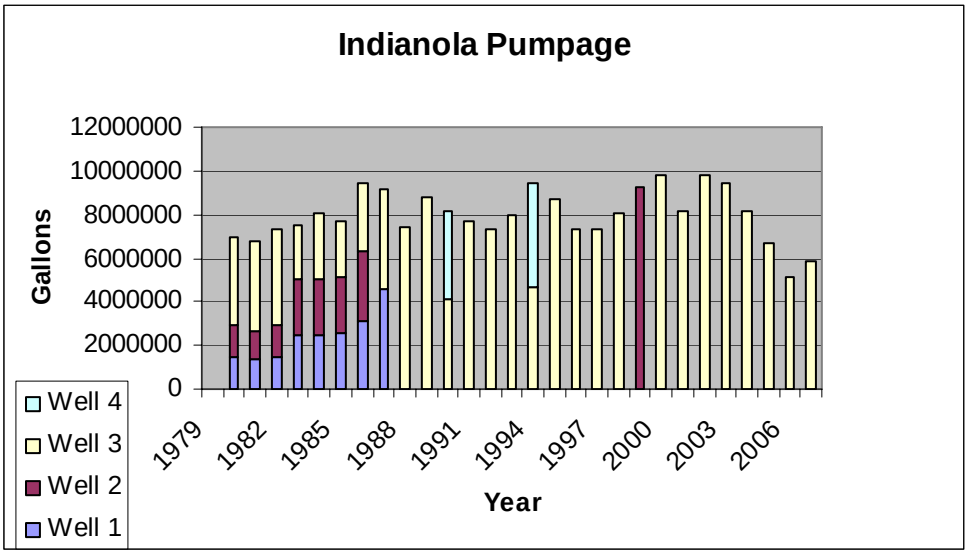
The project criterion ranked Indianola as “adequate” mainly due to its ability to meet present demand in a very short duration although they rely on only one well.

Historic Information

Background Well Information

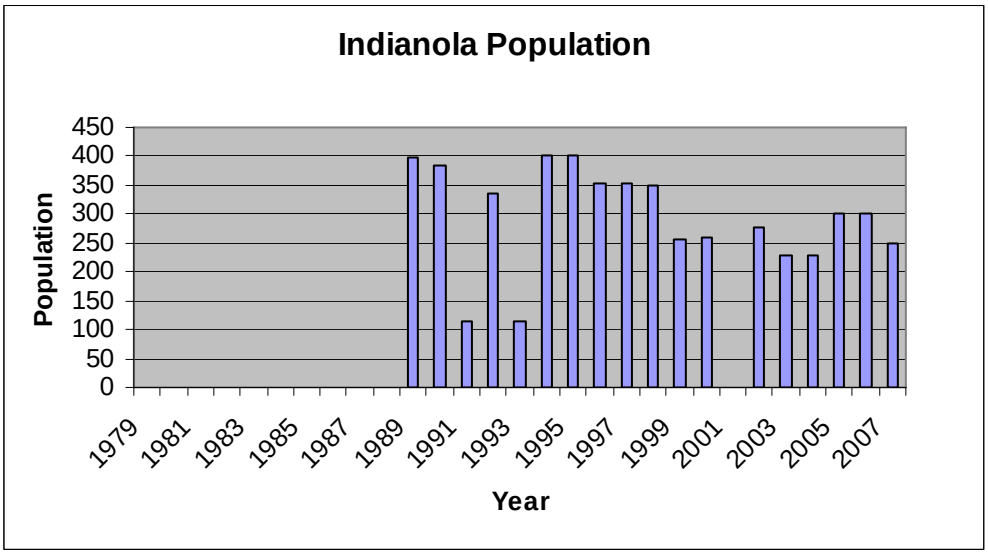
Well No. 3
Finished in sand and gravel deposits located in the Section 17, T.17N., R.12W., Vermilion County. The well was drilled to a depth of 49 feet in 1976 and, upon completion, was pumped at 100 gallons per minute (gpm) for 3 hours with approximately 5.39 feet of drawdown. Calculated specific capacity from this test was 94.61 gpm/ft. Static water level was reported as 3.61 feet below land surface.

Background Pumpage Information



Source: ISWS Illinois Water Inventory Program

Historic Population Information



Source: ISWS Illinois Water Inventory Program

Regional Information

Resources within 5 miles of Indianola (Figure 1).

Domestic Groundwater Supplies
The available regional data indicate that groundwater for domestic and farm use in this area is obtained mainly from large-diameter dug and bored wells finished in the unconsolidated materials above bedrock. These wells tap stringers or lenses of silt, sand, or gravel only a few feet thick contained in the unconsolidated materials above bedrock. They range in depth from about 20 to 50 feet. The yield of this type of well is limited to a few hundred gallons per day and may be only barely adequate for normal household uses.

Occasionally, wells are bored into the bedrock; the yield of these wells is no greater than the wells finished in the overlying unconsolidated materials.

Municipal Groundwater Supplies
There are two towns located within five miles of Indianola; Sidell to the west and Vermilion Grove to the east to the east. The Village of Sidell gets its water from three wells finished in sand and gravel deposits. Wells 3 and 4 are finished in Section 27, T.17N., R.13W., Vermilion County to depths of 28 feet (No. 3) and 22 feet (No. 4). Well 3 pumps at 23gpm while well 4 pumps at 16 gpm. Well No. 6 is finished in Section 26, T.17N., R.13W., Vermilion County to depths of 55 feet and pumps at 55 gpm.

The village of Vermilion Grove reports no water for their town through the use of municipal wells. Vermilion Grove purchase water from the village of Ridge Farm.

Resources within 10 miles of Indianola (Figure 2).

Municipal Groundwater Supplies
Towns within 5 to 10 miles of Indianola include: Jamaica, Fairmount, Brunsenville, Georgetown, Olivet, Westville, Ridge Farm, and Catlin all in Vermilion County; and Cherry Point, Metcalf, and Chrisman all located in Edgar County.

The villages of Jamaica, Bunsenville, Olivet, Catlin, Westville and Cherry Point report no water for their town through the use of municipal wells. Olivet purchases water from Ridge Farm while Westville and Catlin purchase water from Aqua-Illinois in Danville. It is assumed that the residents' water needs at the other three villages are fulfilled through domestic private wells.

The Village of Fairmount currently uses three wells (Nos. 2, 4, & 5) located in Sections 4 and 9, in T.18N., R.13W., Vermilion County. Well No. 2 is finished in sandstone at a depth of 72 feet with a capacity about 15 gallons per minute (gpm). Well Nos. 4 and 5 are finished in sand and gravel deposits at depths of 43 and 47 feet, and are rated at 50 and 40 gpm, respectively.

The Village of Ridge Farm obtains its water from two active community water supply wells. Well Nos. 1 and 2 are finished at 87 and 78 feet, respectively, and are identified as emergency wells. Well Nos. 3 and 4 are the main production wells which are finished in sand and gravel deposits at depths of 92 and 80 feet respectively. Well Nos. 1 and 2 have a combined rating of 200 gpm, Well Nos. 3 and 4 are rated at 200 gpm each. These wells are all located in Section 31, T.17N., R. 11W., Vermilion County.

The Village of Metcalf obtains its water from one community water supply located in Section 34, T.16N., R.13W., Edgar County. The well is finished in sand and gravel and has a rated capacity of 100 gpm.

The Village of Georgetown obtains its water from two active community water supply wells (Nos. 1 and 2). These wells are finished in sand and gravel deposits in the flood plain of the Little Wabash River east of Cayuga, Indiana at depths of 84 (No. 1) and 79 (No. 2) feet below land surface. They each pump at 700 gpm.

The Village of Chrisman currently uses two wells (Nos. 4 & 5) located in Section 26, T.16N., R.12W., Edgar County. Well No. 4 is finished in sand and gravel at a depth of 96 feet with a capacity of about 165 gallons per minute (gpm). Well Nos. 5 is finished in sand and gravel deposits at a depth of 92 feet and is rated at 165 gpm, respectively.

Figures 3 and 4 picture the ISWS Potential Yield maps for sand and gravel and bedrock aquifer in Illinois, respectively. The pertinent counties for Indianola are highlighted. Figure 3 indicates that sand and gravel deposits are variable throughout most of the Indianola area. The bedrock map (Figure 4) indicates poor availability of groundwater from the bedrock throughout the area.

Figures 5 and 6 present the probability of occurrence of the sand and gravel and the water-yielding character of the shallow bedrock for the Sidell area as depicted in the Illinois State Geologic Survey Circular 248, *Groundwater Geology in East-Central Illinois* (Selkregg, et al., 1958). Figure 5 indicates "Fair to Good" variability in the county for sand and gravel deposit development. Figure 6 indicates only small supplies are available from the shallow bedrock units. The domestic well construction records verify these map outlooks.

Groundwater Availability Summary

The available information indicates that the sand and gravel deposits that Indianola currently uses are capable of supplying the necessary water for the village. The long-term yield of Well No.3 was calculated to be around 40 gpm in 1976. The Illinois Environmental Protection Agency information regarding this well indicates the well is rated at 80 gpm; however, recent information indicates it is pumped at around 40gpm.

The available regional information from the surrounding towns indicates that there are adequate sand and gravel deposits for municipal well development throughout this area; however, they are not large, high-yielding type aquifer systems. Exploration by these towns within their local areas has been successful in finding good, reliable groundwater supplies.

Although this supply was rated as "adequate" for this project, relying on only one well for a water supply creates inherent risks, should the well fail. To this end, if the village is considering the development of a second well as a backup to Well No.3 and would use that well as a replacement, a new well at the same location would provide the necessary backup. However, if the village is in need to increase their groundwater use, a second well developed away from Well No.3 would be recommended. It appears that there are sand and gravel deposits associated with Swank Creek in this area. Testing to the southeast of the village, along the creek, would be recommended. If insufficient sand was proven along this creek, testing in the bottoms of the Little Vermilion River would then be recommended. Although Ridge Farm is about five miles southeast of Indianola, they do supply groundwater to other villages in the area (Vermilion Grove and Olivet). Their wells produce at a high rate and they may be able to supply Indianola with additional groundwater. Discussions with the village as well as testing would be necessary.

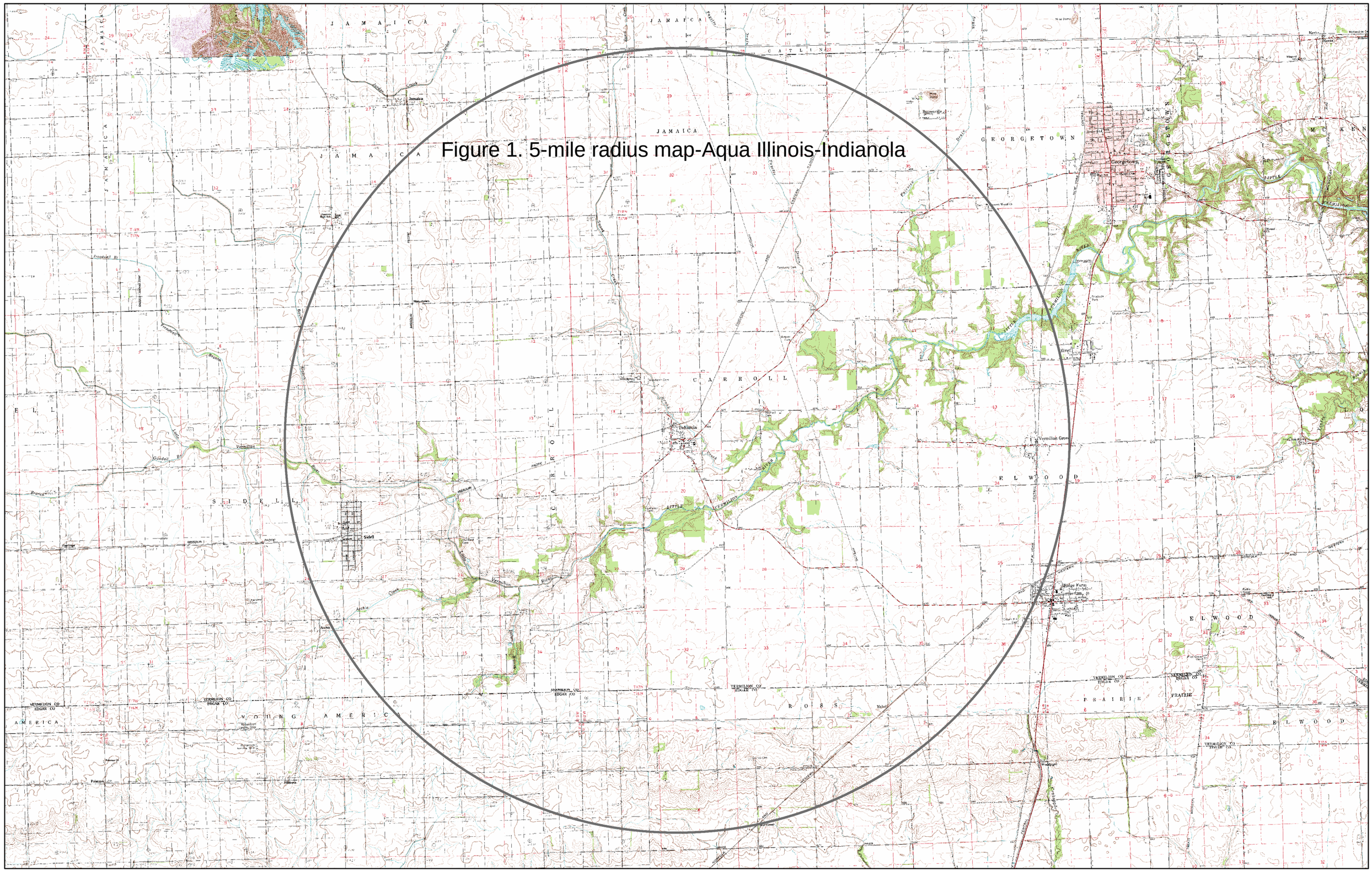


Figure 1. 5-mile radius map-Aqua Illinois-Indianola

Figure 2. 10-mile radius map-Aqua Illinois-Indianola

Estimated Potential Yields of Sand and Gravel Aquifers
in Aqua Illinois-Indianola

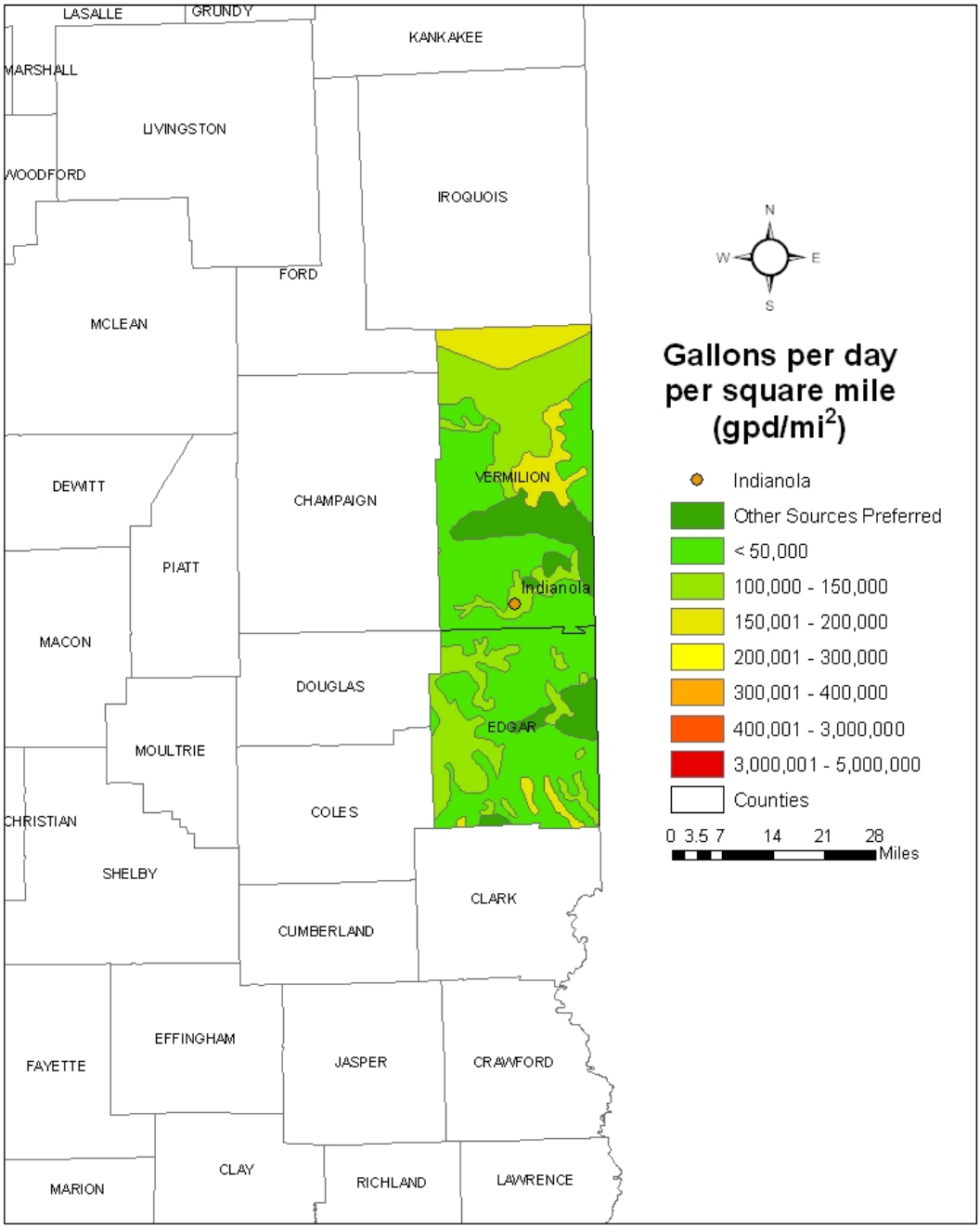


Figure 3.

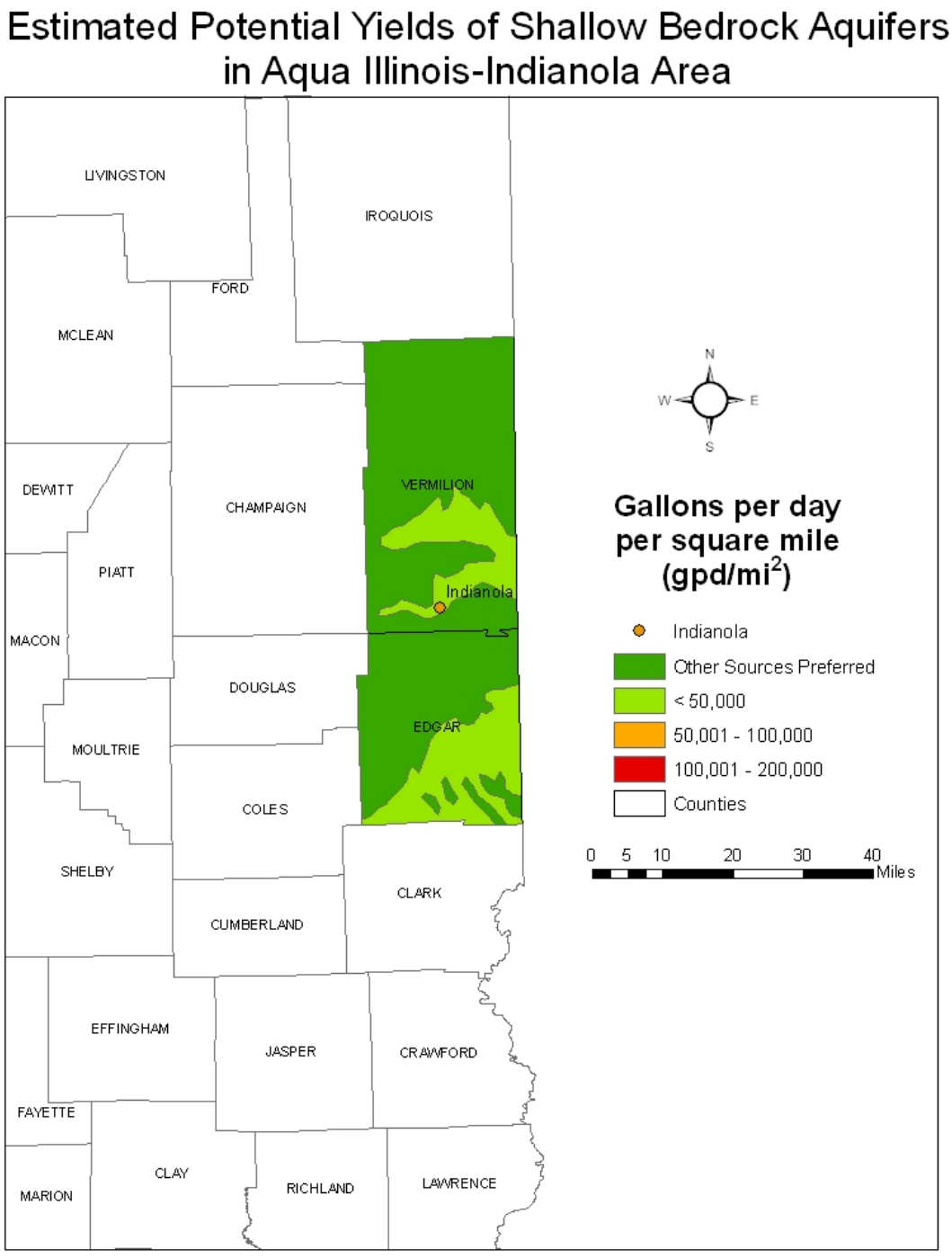

Estimated Potential Yields of Shallow Bedrock Aquifers
in Aqua Illinois-Indianola Area
LIVINGSTON
IROQUOIS
FORD
MCLEAN
DEWITT
CHAMPAIGN
VERMILION
PIATT
Indianola
MACON
DOUGLAS
EDGAR
MOULTRIE
COLES
SHELBY
CLARK
CUMBERLAND
EFFINGHAM
JASPER
CRAWFORD
FAYETTE
CLAY
MARION
RICHLAND
LAWRENCE
N
W
E
S
Gallons per day
per square mile
(gpd/mi2)
Indianola
Other Sources Preferred
< 50,000
50,001 - 100,000
100,001 - 200,000
Counties
0 5 10 20 30 40
Miles

Figure 4.

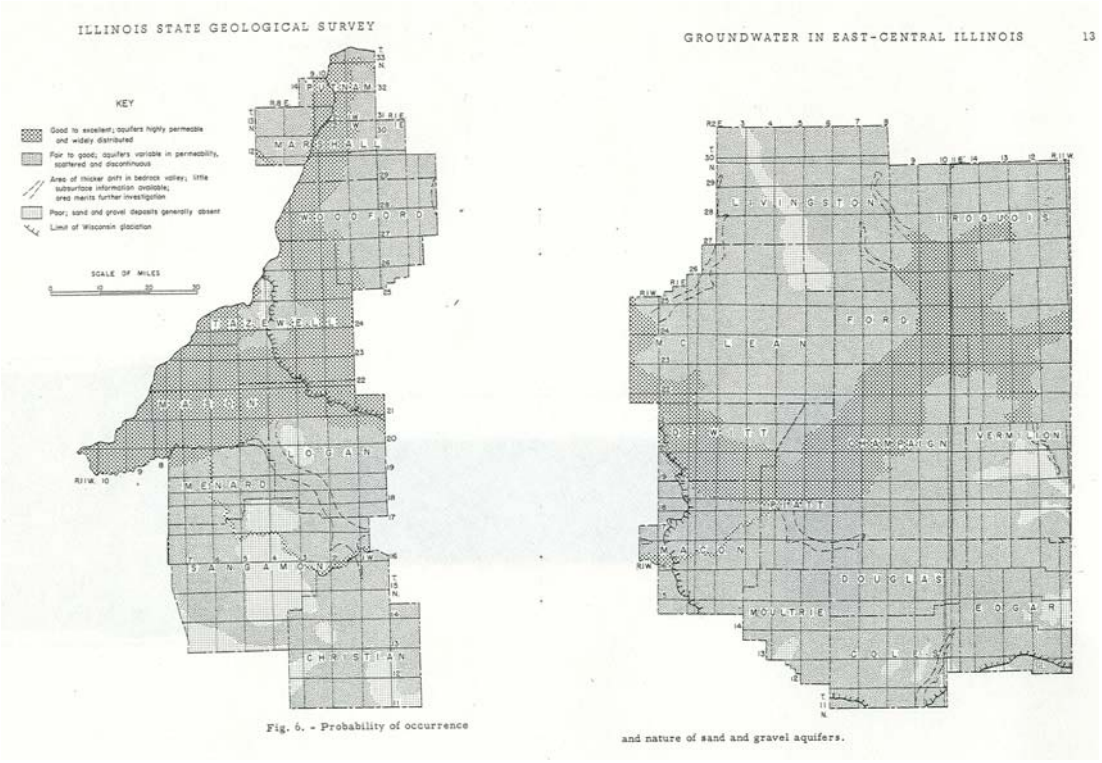


Figure 5.

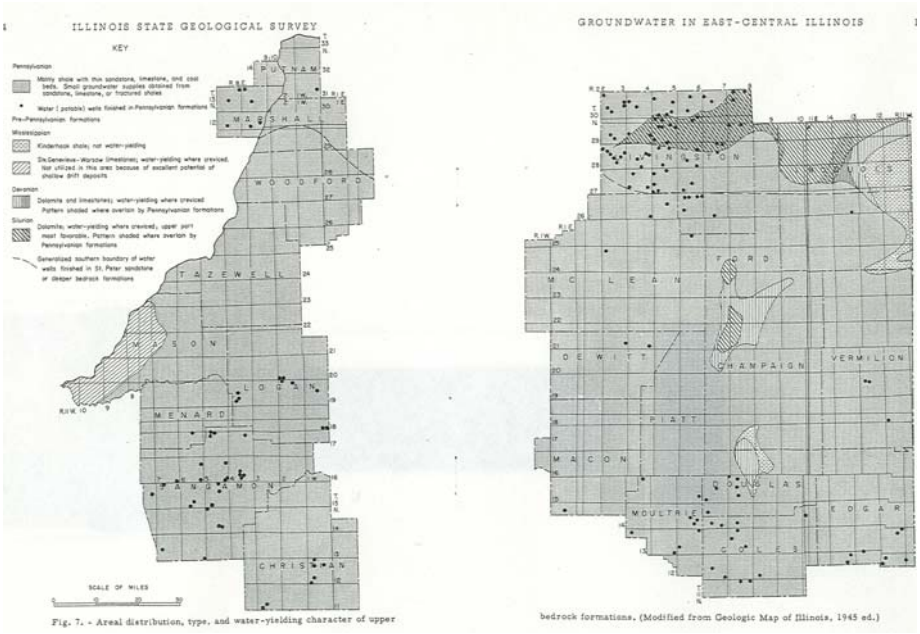


Figure 6.

References

Selkregg, L.F. and J. Kempton. 1958. Groundwater Geology In East-Central Illinois, A preliminary Geologic Report. Illinois State Geological Survey Circular 248.

ISWS publications list for Indianola and surrounding areas.

* = Publication is out of print.
$ = Payment required.

EDGAR

*1965	RI-53	Potential yield of aquifers in Embarras River Basin, Illinois. Walton-Csallany. Open File Report.
1965	RS-48	Relationship between water use and population in the Embarras River Basin, Illinois. Csallany.
*1966	RI-55	Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.
1974	B-60-9	Public groundwater supplies in Edgar County. Woller. 10p.
*1978	CR-199	Reconnaissance study of final cut impoundments. Gibb-Evans. 101p.
1982	COOP-8	Hydrogeologic evaluation of sand and gravel aquifers for municipal groundwater supplies in East-Central Illinois. Kempton-Morse-Visocky. 59p.

VERMILION

*1965	RI-53	Potential yield of aquifers in Embarras River Basin, Illinois. Walton-Csallany. Open File Report.
1965	RS-48	Relationship between water use and population in the Embarras River Basin, Illinois. Csallany.
*1966	RI-55	Yields of wells in Pennsylvanian and Mississippian rocks in Illinois. Csallany. 42p.

*1969	RI-62	Groundwater resources of the buried Mahomet Bedrock Valley. Visocky-Schicht. 52p.
*1978	CR-196	Water supply alternatives for the city of Danville. Singh. 124p.
*1978	CR-199	Reconnaissance study of final cut impoundments. Gibb-Evans. 101p.
*1978	CR-209	Assessment of public groundwater supplies in Illinois. Visocky-Wehrmann-Kim- Ringler. 193p.
*1980	CR-237	Assessment of eighteen public groundwater supplies in Illinois. Wehrmann- Visocky-Burris-Ringler-Brower. 185p.
1982	COOP-8	Hydrogeologic evaluation of sand and gravel aquifers for municipal groundwater supplies in east-central Illinois. Kempton-Morse-Visocky. 59p.
1985	COOP-10	Geology, hydrology, and water quality of the Cambrian and Ordovician Systems in northern Illinois. Visocky-Sherrill-Cartwright. 136p.